REMARKS

In response to the office action mailed August 15, 2007, Applicants amended claims 1, 3, 7-17, 19-24, 28-31, 33, 34, 36, 37, 40-46, 48-52, 54, 55, 59, and 60, cancelled claims 2, 25, 35, 56, and 62-74, and added new claims 75-86. Thus, claims 1, 3-24, 26-34, 36-55, 57-61, and 75-86 are presented for examination.

The Examiner objected to claims 1, 24, 34-41, 45, 53, 55, and 57-60. In view of the claim amendments, Applicants request reconsideration and withdrawal of this objection.

Claims 2, 4-11, 13, 25, 27-29, 35, 37-41, 44-47, and 56-60 stand rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. In particular, the Examiner contended that Applicants failed to enable a person of ordinary skill in the art to make or use the invention as it relates to inducing, tuning, shifting, segregating, or superimposing a combination of vibrations. In Applicants' specification, Applicants explain how torsional vibration induces transverse vibration along their probe. Applicant's explain, for example, that the transducer to which the probe is coupled is vibrated in a direction approximately tangential to the cylindrical surface of the probe to cause a torsional vibration along the probe. Application, p. 11, line 29 – p. 12, line 6. Applicants further explain that the resulting torsional wave produces a component of force in a transverse direction relative to the longitudinal axis of the probe, thereby exciting a transverse wave along the probe. Id., p. 12, line 27 – p. 13, line 2. Applicants explain that the excitation of a transverse vibration by the torsional vibration is dependent upon the physical properties (i.e., length, diameter, etc.) and material properties (i.e., yield strength, modulus, etc.) of the probe. Id., p. 13, lines 19-21. Applicants also explain that transverse vibration is induced when the frequency of the transducer is close to a transverse resonant frequency of the probe. Id., p. 13, lines 26-27. A person of ordinary skill in the art would understand how to determine the transverse resonant frequency of the probe and could thus drive the transducer at a frequency close thereto in order to induce a transverse vibration in the probe without undue experimentation.

With regard to tuning, Applicants explain that the transverse vibration can be tuned into coincidence with the torsional vibration by bending the probe or applying tension to the probe.

See, e.g., Id., p. 25, lines 17-20. Applicants submit that, after reading the specification, a person of ordinary skill in the art would understand how to perform this tuning step without undue experimentation.

Applicants also explain that bending the probe causes a shift in frequency resulting from changes in tension within the probe. Id., p. 14, lines 12-15. In addition, Applicants note that bending the ultrasonic probe can shift a frequency of the ultrasonic probe in a manner such that the transverse vibration coincides with the torsional vibration. Id., p. 25, lines 21-23. Applicants submit that, after reading the specification, a person of ordinary skill in the art would understand how to perform this shifting step without undue experimentation.

Applicants explain with reference to Fig. 7 that the torsional vibration and the transverse vibration can be segregated along the probe. Id., p. 16, line 30 – p. 17, line 7. Applicants submit that, after reading the specification, a person of ordinary skill in the art would understand how to perform this segregation step without undue experimentation.

Applicants explain with reference to Fig. 3 that the torsional and transverse vibrations can be superimposed along the active area of the probe. Applicants submit that, after reading the specification, a person of ordinary skill in the art would understand how to perform this superimposition step without undue experimentation.

In addition, the Examiner contended that Applicants failed to enable a person of ordinary skill in the art to make or use the invention as it relates to a plurality of nodes and anti-nodes along the longitudinal axis of the probe. Applicants addressed this issue in their specification, explaining:

> The number of nodes 50, 60 and the number of anti-nodes 52, 62 occurring along the active area of the ultrasonic probe 15 is modulated by changing the frequency of energy supplied by the ultrasonic energy source 99. The exact frequency, however, is not critical and the ultrasonic energy source 99 run at, for example, about 20 kHz is sufficient to create an effective number of biological material destroying anti-nodes 52, 62 along the longitudinal axis of the ultrasonic probe 15. ... Those skilled in the art will recognize that changing the

> dimensions of the ultrasonic probe 15, including diameter, length and distance to the ultrasonic energy source 99, will affect the number and spacing of the nodes 50, 60 and the anti-nodes 52, 62 along the active area of the ultrasonic probe 15. Id., p. 18, lines 16-26.

As noted by Applicants in their specification, a person of ordinary skill in the art would have understood that the frequency of energy supplied to the probe and the dimensions of the probe affect the number and spacing of nodes and anti-nodes along the probe. Thus, Applicants' description would have been sufficient for such a person to make and/or use a probe that achieves multiple nodes and anti-nodes along its length.

The Examiner also contended that Applicants failed to enable a person of ordinary skill in the art to make or use the invention as it relates to torsional vibration that causes rotation and counter rotation and forward and reverse propagation. However, Applicants explain in their specification that the rotation and counter rotation and forward and reverse propagation of the torsional vibration results from the torsional wave encountering torsional nodes and anti-nodes along the probe. Id., p. 15, lines 13-25. As noted above, a person of ordinary skill would understand, based on Applicants' specification, how to produce multiple nodes and anti-nodes along the probe and would thus understand how to cause rotation and counter rotation and forward and reverse propagation of the torsional vibration.

In view of the foregoing, Applicants request reconsideration and withdrawal of the rejection of claims 2, 4-11, 13, 25, 27-29, 35, 37-41, 44-47, and 56-60 under 35 U.S.C. § 112, first paragraph.

Claims 1-36, 40, and 42 -74 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Kuris (U.S. Patent 3,565,062). As noted above, Applicants cancelled claims 62-74. Kuris fails to disclose or suggest a probe and transducer adapted so that a torsional vibration created along the probe induces a transverse vibration along the probe, as required by claims 1-33, or producing a torsional vibration along the probe that induces a transverse vibration along the probe, as required by claims 34-61. Rather, Kuris discloses vibrating his probe in a longitudinal mode, a transverse mode, a flexural mode, a compressional mode, a combined longitudinal and

transverse mode, a combined torsional and longitudinal mode, a combined longitudinal and flexural mode, and a combined longitudinal and flexural mode. See, e.g., Kuris, col. 4, lines 42-50; col. 8, lines 57-62. Kuris does not disclose vibrating his probe in a combined torsional and transverse mode. And Kuris certainly gives no indication that his probe and transducer are adapted so that a torsional vibration created along his probe induces a transverse vibration along his probe, or that during use a torsional vibration along his probe induces a transverse vibration along his probe. Therefore, Applicants request reconsideration and withdrawal of this rejection.

Claims 37-39 and 57-58 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Kuris in view of McCullough (U.S. Patent 6,723,451). However, McCullough fails to cure the deficiencies of Kuris noted above. McCullough, for example, does not disclose or suggest vibrating his probe in a combined torsional and transverse mode. Nor does McCullough disclose or suggest a probe and transducer adapted so that a torsional vibration created along the probe induces a transverse vibration along the probe, or that during use a torsional vibration along a probe induces a transverse vibration along the probe. Thus, Applicants request reconsideration and withdrawal of this rejection.

The Examiner neglected to initial Desig. ID A808 on sheet 31 of the form PTO-1449 that Applicants submitted on September 27, 2006. Applicants kindly request that the Examiner provide Applicants with a copy of the above-noted sheet with Desig. ID A808 initialed.

The fee in the amount of $60.00 for the Petition for Extension of Time is being paid herewith on the Electronic Filing System (EFS) by way of Deposit Account authorization. Please apply any other charges or credits to deposit account 06-1050, referencing Attorney Docket No. 18554-036001.

Respectfully submitted,

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Michael R. Hamlin
Reg. No. 54,149

Fish & Richardson P.C.
225 Franklin Street
Boston, MA 02110
Telephone: (617) 542-5070
Facsimile: (617) 542-8906

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